

We claim:

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1. A hot melt moisture cure polyurethane adhesive composition comprising at least one polyurethane prepolymer, said polyurethane prepolymer comprising the reaction product of a polyol component and a polyisocyanate component, said polyol component comprising:
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- a) at least one amorphous polyester polyol comprising the reaction product of neopentyl glycol, hexanediol and at least one of phthalic anhydride and phthalic acid;
- b) at least one liquid polyester polyol having a viscosity of greater than about 10,000 cps at 80° C;
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- c) at least one crystalline polyester polyol having a melting point of from about 40° C to about 120 °C; and
- d) at least one thermoplastic polyurethane.
2. The adhesive composition of claim 1, wherein said polyol component comprises from about 5 wt % to about 30 wt % said amorphous polyester polyol.
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3. The adhesive composition of claim 2 wherein said polyol component comprises from about 10 wt % to about 20wt % said amorphous polyester polyol.

4. The adhesive composition of claim 1, wherein said liquid polyester polyol comprising the reaction product of

at least one diol selected from the group consisting of ethylene glycol, diethylene glycol, neopentyl glycol, hexanediol and butanediol, and

5 at least one diacid selected from the group consisting of adipic acid, phthalic acid, terephthalic acid, isophthalic acid and mixtures thereof.

5. The adhesive composition of claim 1, wherein said polyol component comprises from about 20 wt % to about 60 wt % said liquid polyester polyol.

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6. The adhesive composition of claim 5, wherein said polyol component comprises from about 30 wt % to about 50 wt % of said liquid polyester polyol.

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7. The adhesive composition of claim 1, wherein said crystalline polyester polyol comprises the reaction product of at least one diol selected from the group consisting of ethylene glycol, hexanediol and butanediol, and at least one diacid selected from the group consisting of adipic acid, sebacic acid, dodecanedioic acid and terephthalic acid.

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8. The adhesive composition of claim 1, wherein said polyol component comprises from about 10 wt % to about 50 wt % said crystalline polyester polyol.

9. The adhesive composition of claim 8, wherein said polyol component comprises from about 20 wt % to about 40 wt % said crystalline polyester polyol.

5 10. The adhesive composition of claim 1, wherein said polyol component comprises from about 5 wt % to about 20 wt % said thermoplastic polyurethane.

10 11. The adhesive composition of claim 1, wherein said amorphous polyester polyol comprises the reaction product of neopentyl glycol, hexanediol and phthalic anhydride having a hydroxy number of from about 30 to about 75.

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12. The adhesive composition of claim 11, wherein said amorphous polyester polyol has a hydroxy number of from about 50 to about 60.

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13. The adhesive composition of claim 1, wherein said thermoplastic polyurethane comprises the reaction product of

at least one soft segment selected from the group consisting of polyether, polyester and polycaprolactone, and

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methylene diphenyl diisocyanate.

14. The adhesive composition of claim 1, wherein said adhesive composition further comprises at least one thermoplastic polymer selected from the group consisting of ethylene/vinyl acetate/copolymers, ethylene/n-butylacrylate copolymers, ethylene/methyl acrylate copolymers, ethylene/acrylate

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copolymers, acrylic polymers, butylene/poly(alkylene ether) phthalate polymers, and mixtures thereof.

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15. The adhesive composition of claim 1, wherein said polyisocyanate component comprises at least one polyfunctional isocyanate having an isocyanate functionality of at least about 2.0.
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16. The adhesive composition of claim 15, wherein said polyisocyanate component is diphenylmethane-4,4'-diisocyanate.
17. The adhesive composition of claim 1, wherein said adhesive composition has a viscosity of from about 5,000 cps to about 70,000 cps at 250° F.
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18. The adhesive composition of claim 17, wherein said adhesive composition has a viscosity of from about 10,000 cps to about 50,000 cps at 250° F.
19. The adhesive composition of claim 1, wherein said adhesive composition has a percent weight NCO (% NCO) of no greater than about 5.
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20. The adhesive composition of claim 1, wherein said adhesive composition exhibits an open time of no greater than about 12 minutes.
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21. The adhesive composition of claim 20, wherein said adhesive composition exhibits an open time of from about 2 minutes to about 8 minutes.

22. The adhesive composition of claim 20, wherein said composition exhibits an open time of from about 5 seconds to about 30 seconds.

23. The adhesive composition of claim 1, wherein said adhesive composition, upon cure, exhibits a peel adhesion failure temperature (PAFT) of at least about 220° F.

24. The adhesive composition of claim 1, wherein said adhesive composition, upon cure, exhibits a peel adhesion failure temperature (PAFT) of at least about 250° F.

25. The adhesive composition of claim 1, wherein said adhesive composition, upon cure, exhibits a peel adhesion failure temperature (PAFT) of at least about 300° F.

26. A process for bonding substrates together comprising

- a) applying the hot melt moisture cure adhesive composition of claim 1 on at least one surface of a first substrate,
- b) contacting said applied adhesive composition with a second substrate, and
- c) curing said adhesive composition.

27. The process of claim ²⁶24, wherein at least one of said first and second substrates is selected from the group consisting of polyvinylchloride (PVC), polystyrene, polyacrylate, acrylonitrile-butadiene-styrene (ABS), ethylene-vinyl acetate (EVA), polycarbonate, fiber reinforced plastic (FRP),

polyurethane, Nylon, primed steel, leather, rubber, paper and wood composite panels.

- 5 28. An article comprising a profile, a foil and the adhesive composition of claim 1 sandwiched between said profile and said foil.

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- 10 29. An article comprising a first substrate, a second substrate and the adhesive composition of claim 1 sandwiched between said first and second substrates, wherein said article is selected from the group consisting of construction of recreational vehicle side walls, architectural doors, furnitures, books and shoes.